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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/771,181

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Robert Raymond Miller II

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09/30/2004

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EXAMINER

KUMAR, PANKAJ

ART UNIT

PAPER NUMBER

2631

DATE MAILED: 09/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/771,181

Applicant(s)

MILLER ET AL.

Examiner

Pankaj Kumar

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 3-6, 19 are in improper form because a multiple dependent claim must refer to multiple claims in the alternative. See MPEP § 608.01(n).
2. Claim 3 refers to both claims 1 and 2 but not in the alternative. Claims 4-6 depend on claim 3. Accordingly, claims 3-6 has not been further treated on the merits.
3. Claim 19 is referring to claims 17 and 18 but not in the alternative. Authorization for an examiner's amendment to correct claim 19 was given in a telephone interview with Sam Dworetsky on 9/13/2004 at 908-532-1855. However, since this application is not in condition of allowance yet, applicant should make the following correction as was discussed in the interview:

In the claims:

claim 19 line 1, "claim 17" should be changed to ---claim 18---

claim 19 line 3, "needed for the steps of claim 18" should be removed.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for excluding noisy bins, does not reasonably provide enablement for "where bins flagged by the pre-filtering step remain unexcluded, said scheme excludes the bins flagged in the pre-filtering step" (i.e. from claim 1). The specification does not enable any

Art Unit: 2631

person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. This section of the claim seems to contradict the specification such as specification page 6 lines 15-19.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-25 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: for example in claim 1, there is no link between the initializer, prefilter, splitter, etc.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 7, 8, 9, 11, 15, 16, 17, 23, 24, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levin 5852633 in view of Yeap 6456657.

10. As per claim 1, Levin in view of Yeap teaches a method for allocation of an available power budget to Discrete Multi-Tone (DMT) frequency tones in a DMT-based Digital Subscriber Line (DSL) modem, comprising the steps of: initializing the DMT-based DSL

Art Unit: 2631

modem by calculating aggregate values of channel attenuation (Levin figs. 3-7: i; Sankaranarayanan 6134274 col. 6: summing N_k for all k bins gives attenuation for channel), noise power (Levin figs. 3-7: noise), and power mask (Levin fig. 3: defining max b_i is defining the maximum number of bits in a bin which define the maximum power or power mask); pre-filtering to flag noisy bins that are unable to support a minimum number of bits with a maximum power available for transmission in a bin (Levin 5852633 fig. 6: 612, 613, 615; Yeap col. 2 line 12: eliminating noisy subbands); , and where bins flagged by the pre-filtering step remain unexcluded, said scheme excludes the bins flagged in the pre-filtering step (Levin fig. 6: since data from worst bins have been swapped to the best bins, the worst bins are excluded).

11. What Levin does not teach is using a repeated-bisection splitting scheme to allocate the available power substantially optimally among a plurality of bands for DMT frequency tones. What Yeap teaches is using a repeated-bisection splitting scheme to allocate the available power substantially optimally among a plurality of bands for DMT frequency tones (Yeap 6456657 fig. 7a, 7b; cols. 1, 2: DMT). Also, when a bin is removed from a set of bins, the set of bins is split since bins to the left and right of the removed bin are now separated. It would have been obvious to one skilled in the art at the time of the invention to modify Levin with the teachings of Yeap. One would have been motivated to do so since Levin wants to work with data from good bins, Yeap teaches to split the bins by eliminating noisy subchannels (Yeap col. 2 lines 12-13)

12. As per claim 7, Levin in view of Yeap teaches the method of claim 1 wherein the available power is allocated to 2^n tones where n is a preselected integer (Levin fig. 3: using bit pools of 2 i.e. 2 bits per bin; fig. 6: choosing N best bins; each bit in a bin has a tone).

13. As per claim 8, Levin in view of Yeap teaches the method of claim 7 wherein initializing includes calculating aggregate parameter values of channel attenuation, noise power, and power mask for n subsequent steps (Levin figs. 3-7: i).

14. As per claim 9, Levin in view of Yeap teaches an apparatus for allocating an available power to a plurality of Discrete Multi-Tone (DMT) frequency tones using a repeated-bisection of power scheme to partition the available power over the plurality of DMT frequency tones in a DMT-based Digital Subscriber Line (DSL) modem, comprising: an initialization unit, for initializing the DMT-based DSL modem by calculating aggregate parameter values of channel attenuation, noise power, and power mask; a pre-filtering unit, coupled to the initialization unit, for pre-filtering to flag noisy bins that are unable to support a minimum number of bits with a maximum power available for transmission in a bin; and a repeated-bisection power splitting and allocation unit, coupled to the pre-filtering unit, for using the repeated-bisection of power scheme to allocate available power substantially optimally among a plurality of bands for DMT frequency tones. (discussed above)

15. As per claim 11, Levin in view of Yeap teaches the apparatus of claim 9 wherein the initialization unit is further coupled to the prefiltering unit to receive notification of the bins that are flagged, calculates aggregate parameter values needed to implement the repeated-bisection of power scheme and excludes bins flagged by the pre-filtering unit. (discussed above)

Art Unit: 2631

16. As per claim 15, Levin in view of Yeap teaches the apparatus of claim 9 wherein the available power is allocated to 2^n tones where n is a preselected integer. (discussed above)

17. As per claim 16, Levin in view of Yeap teaches the apparatus of claim 9 wherein the initialization unit initializes the modem by calculating aggregate parameter values of channel attenuation, noise power, and power mask for n subsequent steps. (discussed above)

18. As per claim 17, Levin in view of Yeap teaches computer readable medium having computer-executable instructions for allocation of an available power to Discrete Multi-Tone (DMT) frequency tones in a DMT-based Digital Subscriber Line (DSL) modem, wherein the computer-executable instructions comprise the steps of: initializing the modem by calculating aggregate values of channel attenuation, noise power, and power mask; pre-filtering to flag noisy bins that are unable to support a minimum number of bits with a maximum power available for transmission in a bin; and using a repeated-bisection splitting scheme to allocate the available power substantially optimally among a plurality of bands for DMT frequency tones. (Levin fig. 1: 56 is a computer; remainder discussed above)

19. As per claim 23, Levin in view of Yeap teaches the computer readable medium of claim 17 wherein the available power is allocated to 2^n tones where n is a preselected integer. (discussed above)

Art Unit: 2631

20. As per claim 24, Levin in view of Yeap teaches the computer readable medium of claim 17 wherein initializing includes calculating aggregate parameter values of channel attenuation, noise power, and power mask for n subsequent steps. (discussed above)

21. As per claim 25, Levin in view of Yeap teaches a modem having an apparatus for allocating an available power to a plurality of Discrete Multi-Tone (DMT) frequency tones using a repeated-bisection of power scheme to partition the available power over the plurality of DMT frequency tones in a DMT-based Digital Subscriber Line (DSL) modem, the apparatus comprising: an initialization unit, for initializing the DMT-based DSL modem by calculating aggregate parameter values of channel attenuation, noise power, and power mask; a pre-filtering unit, coupled to the initialization unit, for pre-filtering to flag noisy bins that are unable to support a minimum number of bits with a maximum power available for transmission in a bin; and a repeated-bisection power splitting and allocation unit, coupled to the pre-filtering unit, for using the repeated-bisection of power scheme to allocate available power substantially optimally among a plurality of bands for DMT frequency tones. (discussed above)

Allowable Subject Matter

22. Claims 2, 10, 12, 13, 14, 18, 19, 20 , 21, 22 (assuming claim 19 is corrected as discussed in the interview) would be allowable if rewritten to overcome the rejection(s) under 35

U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pankaj Kumar whose telephone number is (571) 272-3011. The examiner can normally be reached on Mon, Tues, Wed and Thurs after 8AM to after 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PK

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